

ECR #: 48

Title: AGP Card Retention Feature

Release Date: 12/14/98

Impact: Change

Spec Version: A.G.P. 2.0

Summary:

AGP cards require retention in addition to the I/O mounting bracket, which is currently the sole method of retaining the cards. Using only the I/O mounting bracket as the retainer results in failures during the system and board level shock and vibration tests. AGP cards do not currently have any features that allow retention of the card other than the I/O bracket. This ECR proposes the addition of a feature in the mechanical keying tab that can be utilized to retain the AGP card. Adding this feature alone will not retain the card, but will allow the use of AGP retainer devices to work with the new feature in combination with the current I/O mounting bracket retention system. It is recommended that all new cards be modified with the retention feature. All 1.5 volt 4X mode cards are required to have this feature.

Background:

The AGP card plugs into the AGP connector 8.89 mm (.350 inches). If the card backs out of the connector > 0.99 mm (.039 inches) under shock and vibration, the interconnection between the card and connector can be interrupted, due to the internal two tier contact system within the connector that allows denser interconnect packaging and the associated tolerances within the connector, on the card, and to the motherboard. The AGP connector is shorter than ISA and PCI connectors, and is positioned further away from the back I/O wall of the chassis, which tends to amplify dynamically induced back-out forces on the card.

Another source for AGP retention problems is from chassis induced backout of the card. The AGP card has an I/O bracket that mounts to the I/O panel at the rear of the chassis, as is the case with ISA and PCI cards. Using the bracket as the only retention mechanism can be a problem for AGP cards. Angular chassis tolerances between the I/O wall and motherboard can result in forces on the AGP card that rotate the card out of the connector.

In summary, shock and vibration conditions during shipment and chassis induced card backout result in a need for a secondary anchor of the card in addition to the current I/O mounting bracket through the use of a retainer. Preliminary shock and vibration tests show that stiffer chassis with stiff I/O back panels do not have as great a problem retaining AGP cards as do typical ATX chassis with thinner walls. However, it is recommended that all PC's incorporate an AGP retainer in addition to the current I/O mounting bracket retention method.

Change Request:

Section 5.1

The A.G.P. expansion card requires a mounting bracket to properly locate the card with respect to the chassis **and to assist with card retention.**

Section 5.4.3.3

Change title from Contact Backout Wipe to AGP Card Retention

Also modify 5.4.3.3 to the following:

AGP Card Retention

The AGP interconnect design requires that the AGP card must be retained to the extent that the card not back out more than .99 mm (.039 in) within the AGP connector. To accomplish this it is recommended that new cards implement an additional notch feature in the mechanical keying tab to allow an anchor point on the AGP card for interfacing with AGP retention devices. See Figures 5-1A, B, C, D, 5-3, and 5-5. This new retention feature alone does not retain the card, but can be used in combination with AGP retainers and with the I/O mounting bracket to fully retain the AGP card. The retention feature is required in 1.5 volt cards and is recommended for new 3.3 volt cards. The AGP retainer also requires additional keep-outs on the motherboard around the AGP connector. See Figures 5-12 A&B, 5-13A&B, and 5-14A&B.

In systems that use the AGP Pro connector, AGP Pro as well as AGP cards need to use AGP Pro retention mechanisms, see the AGP Pro Specification. The AGP Pro connector does not support AGP retention devices that utilize the AGP card notch.

The following Figures are modified or are new:

5-1A

5-1B

5-1C (new)

5-1D (new)

5-3

5-5

5-12A

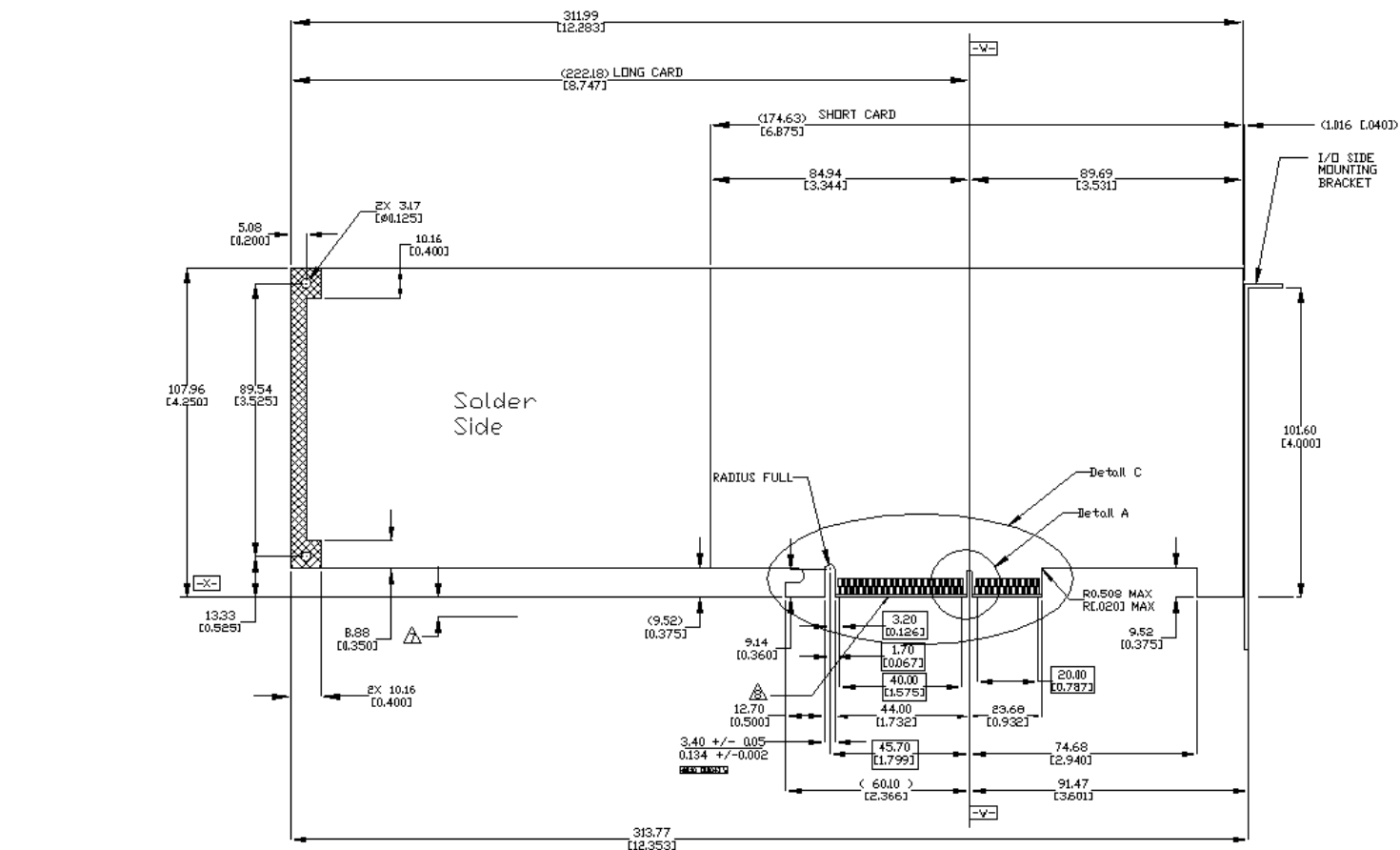
5-12B (new)

5-13A

5-13B (new)

5-14A

5-14B (new)



- Notes:
1. TOLERANCES +/- .127 (.005)
 2. SOLDER SIDE MAX COMPONENT HEIGHT IS 2.667 [0.105] UNLESS OTHERWISE SPECIFIED, SEE FIGURE 5-1C FOR ADDITIONAL HEIGHT RESTRICTIONS
 3. COMPONENT SIDE MAX COMPONENT HEIGHT IS 14.47 [0.570]
 4. DOUBLE HATCHED AREAS TO BE COMPONENT FREE SOLDER SIDE AND COMPONENT SIDE
 5. MOUNTING BRACKETS ARE TO BE DESIGNED ACCORDING TO CURRENT PCI SPEC PINS B1-62 ARE LOCATED ON COMPONENT SIDE
- THIS IS A 1MM CONTACT SYSTEM, CONVERSION TO ENGLISH SHOULD BE CARRIED OUT TO AT LEAST 5 DIGITS
- 6.604 [260] TO MOTHERBOARD
- SOLDER MASK MUST NOT COVER GOLD FINGERS

Figure 5-1A: 3.3 Volt A.G.P. ATX Form Factor Add-in Card

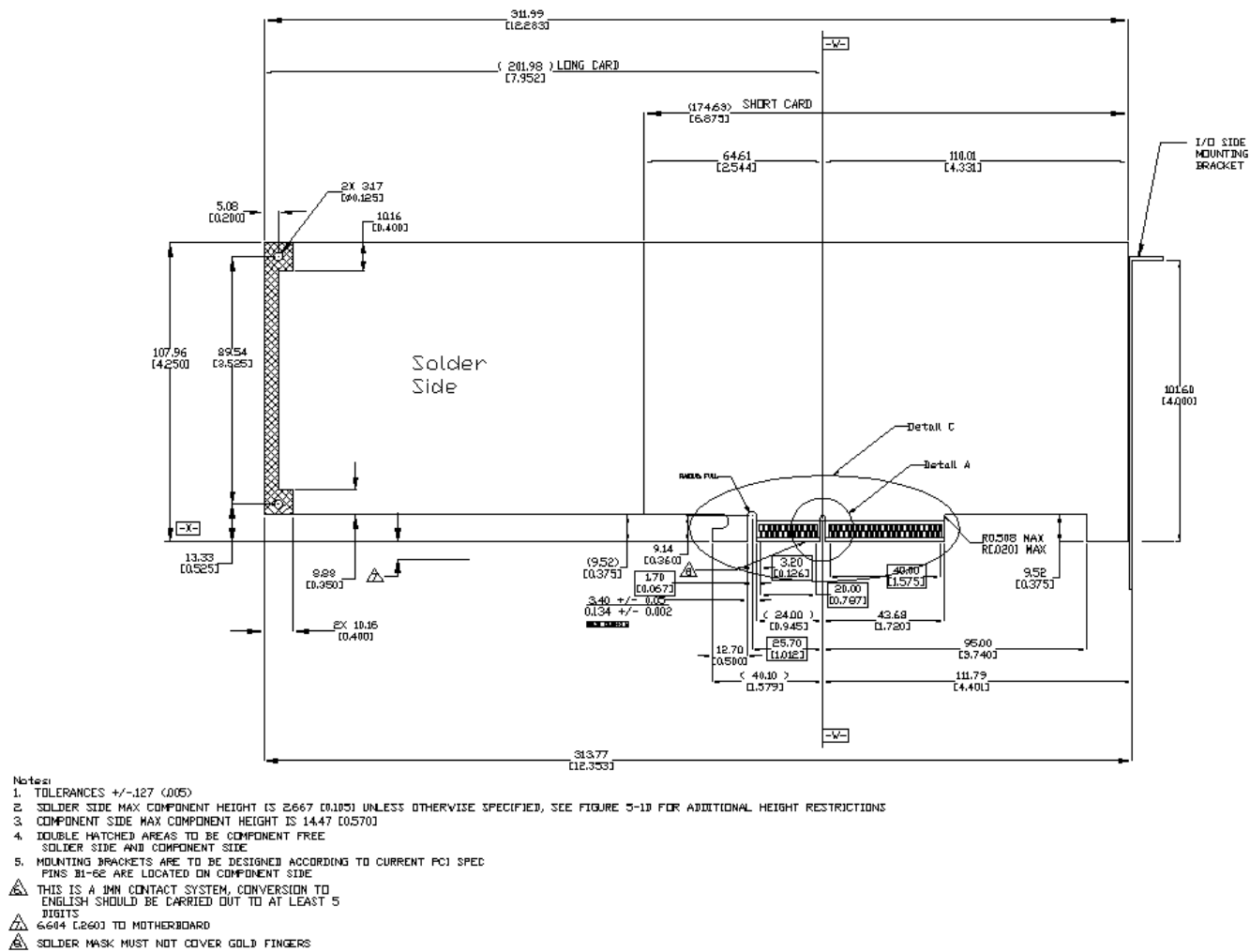
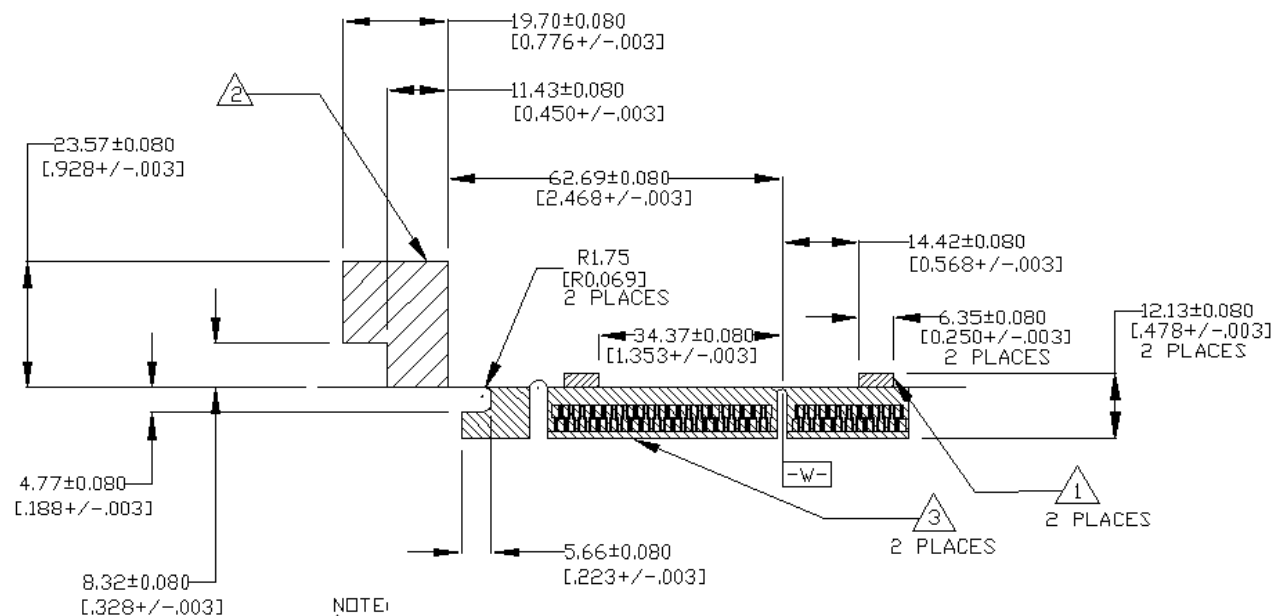


Figure 5-1B: 1.5 Volt A.G.P. ATX Form Factor Add-in Card



- NOTE:
- 1. MAXIMUM COMPONENT HEIGHT IN HATCHED AREA IS 2.03 [0.080] BOTH SIDES
 - 2. MAXIMUM COMPONENT HEIGHT IN HATCHED AREA IS 1.27 [0.050] ON SECONDARY SIDE, OPTIONAL ON PRIMARY SIDE.
 - 3. NO COMPONENTS IN HATCHED AREA BOTH SIDES

Figure 5-1C: DETAIL C. Design Feature for A.G.P. Card Retention Device for 3.3 Volt Card

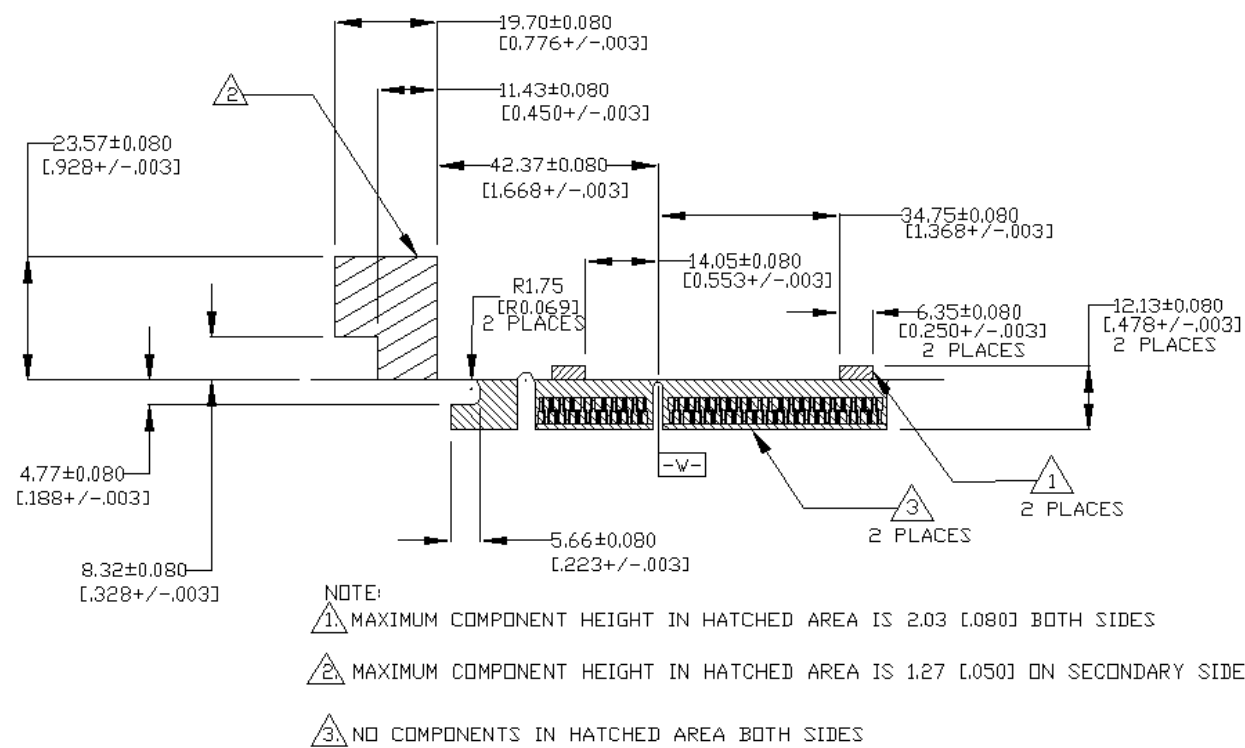
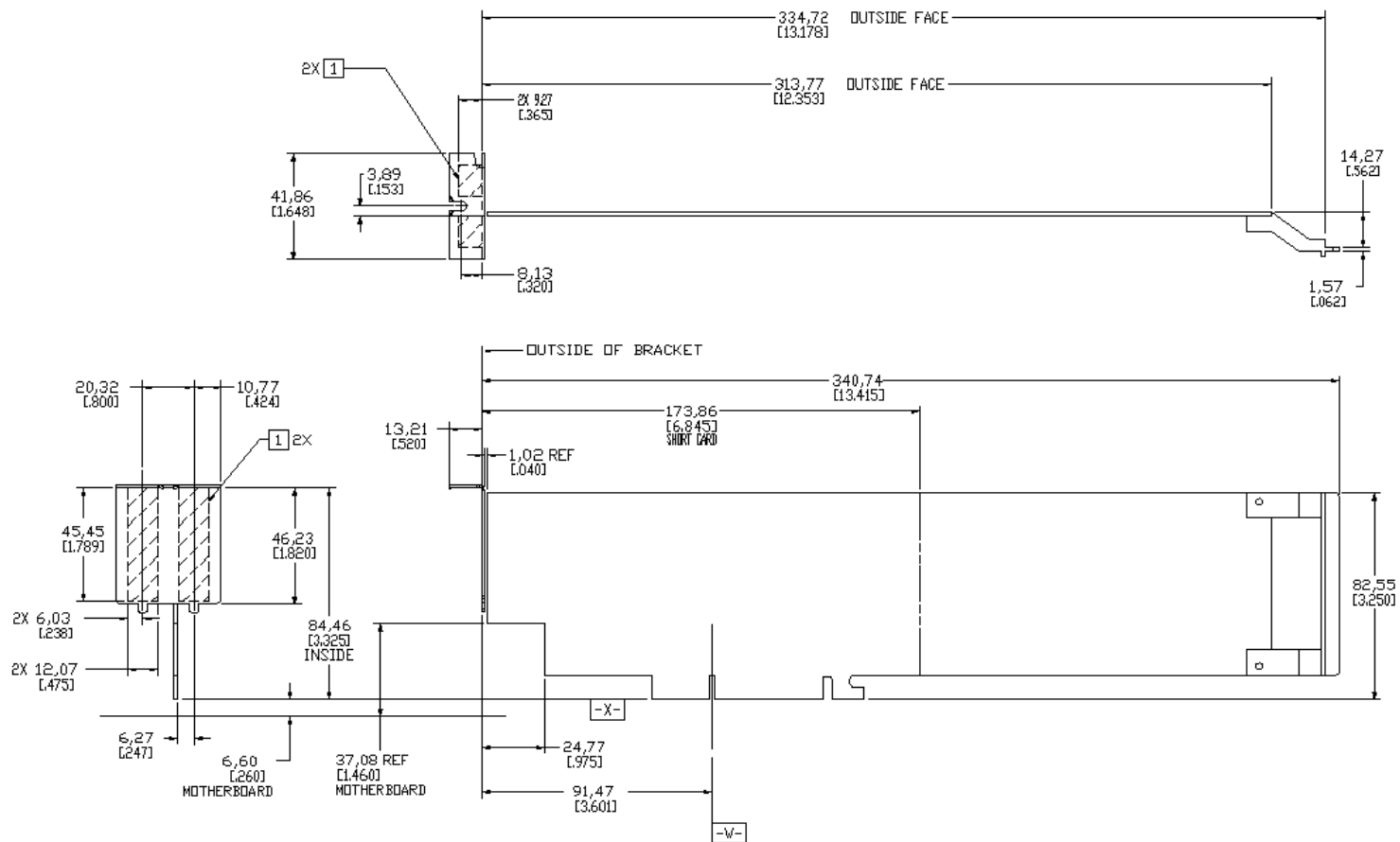


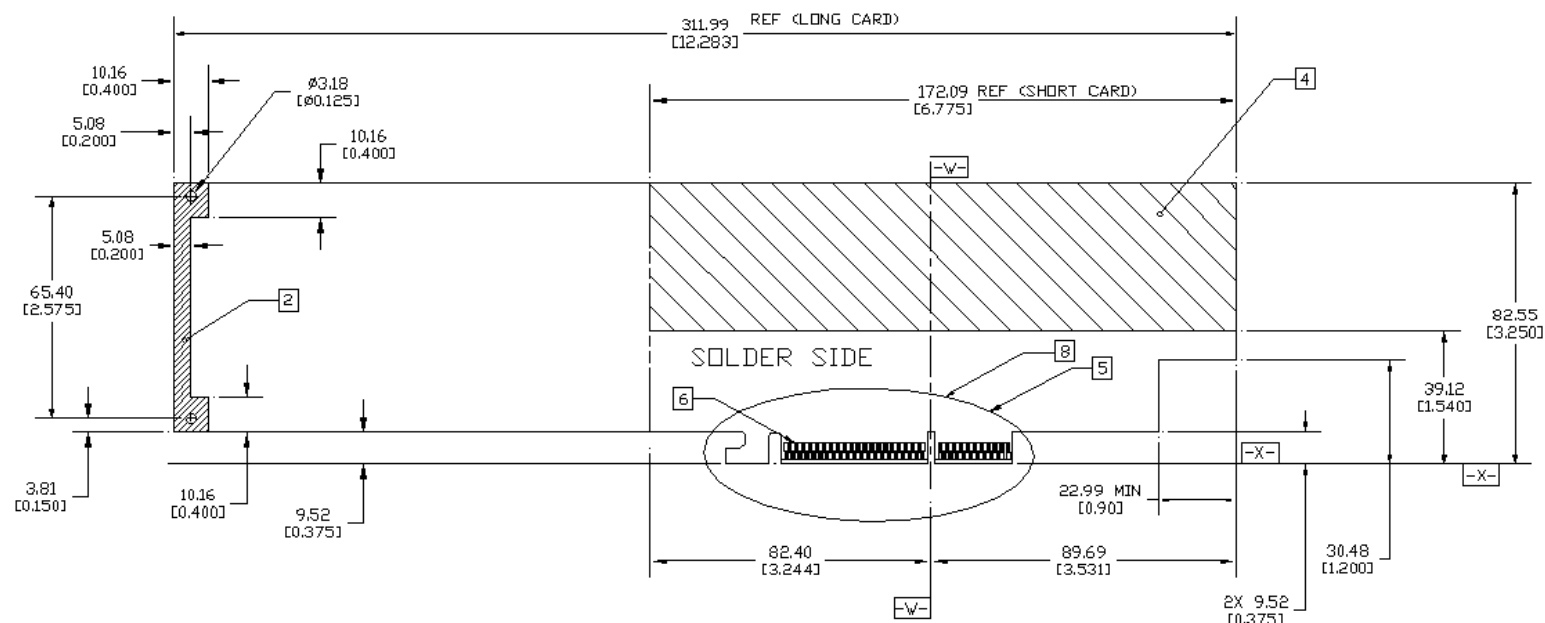
Figure 5-1D: DETAIL C. Design Feature for A.G.P. Card Retention Device for 1.5 Volt Card.



NOTES:

- 1 HATCHED AREAS DEFINE THE SIZE AND POSITION OF THE OPENINGS IN THE CHASSIS TO ACCEPT THE NLX FORM FACTOR AGP CARD ASSEMBLY.

Figure 5-3: A.G.P. NLX Form Factor Add-in Card.



NOTES:

1. TOLERANCES +/- .127 [+/- .005]
2. THIS AREA TO BE COMPONENT FREE BOTH SIDES.
3. MAXIMUM ALLOWABLE HEIGHT ON SOLDER SIDE IS 2.667 [1.05] UNLESS OTHERWISE SPECIFIED.
4. SOLDER SIDE COMPONENTS IN THIS AREA RESTRICTED TO 22.35 [.880].
5. GOLD FINGERS AND TABS SAME AS DETAILED IN ATX AGP DESIGN. FOR MORE DETAILED INFORMATION REFER TO FIG 5-1C & D.
6. SOLDER MASK MUST NOT COVER GOLD FINGERS BOTH SIDES
7. COMPONENT SIDE MAX COMPONENT HEIGHT IS 14.47 [.570]
8. THIS IS A 1 MM CONTACT SYSTEM, CONVERSION TO ENGLISH SHOULD BE CARRIED OUT TO AT LEAST 5 DIGITS

Figure 5-5: A.G.P. NLX Form Factor Card Detail.

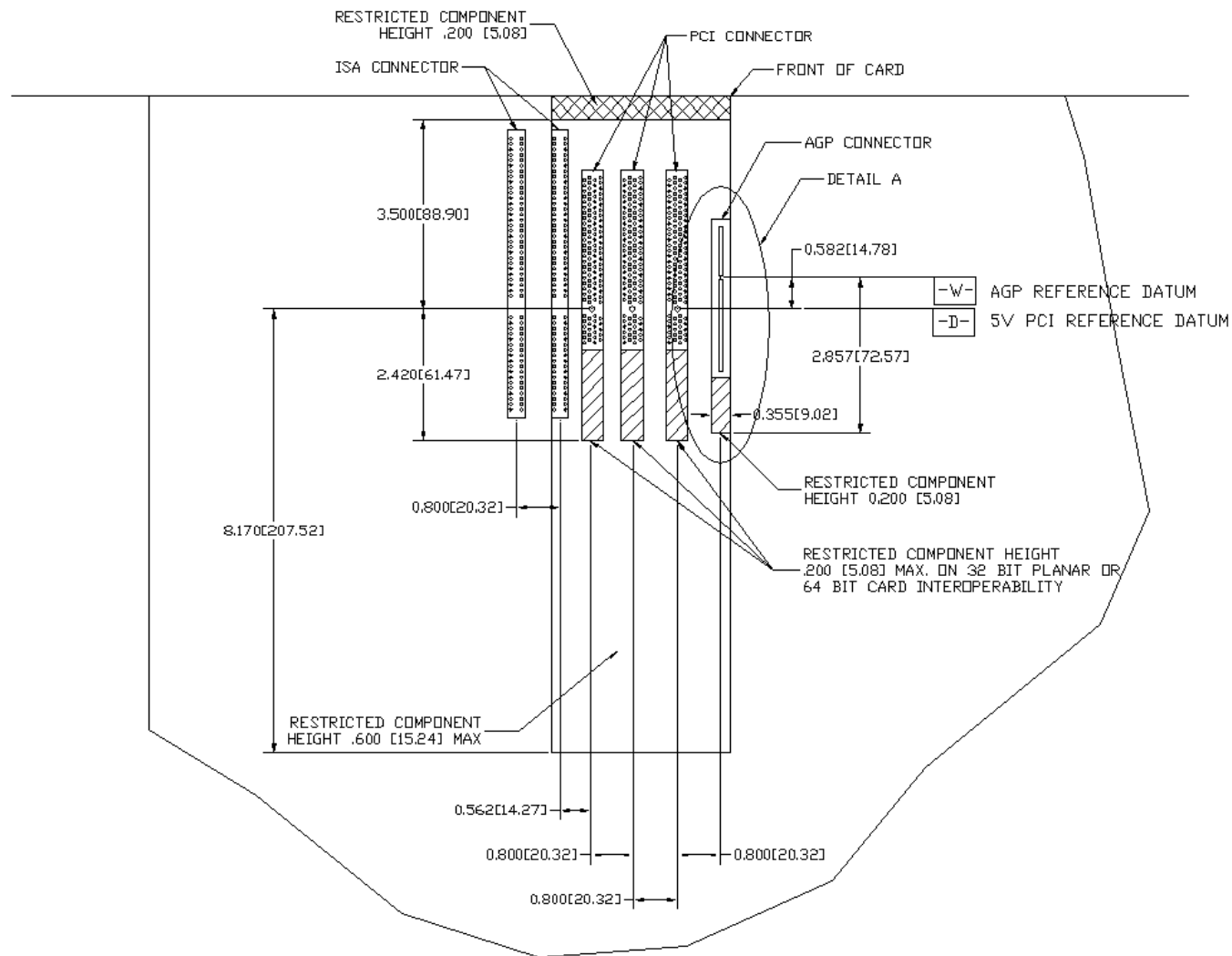
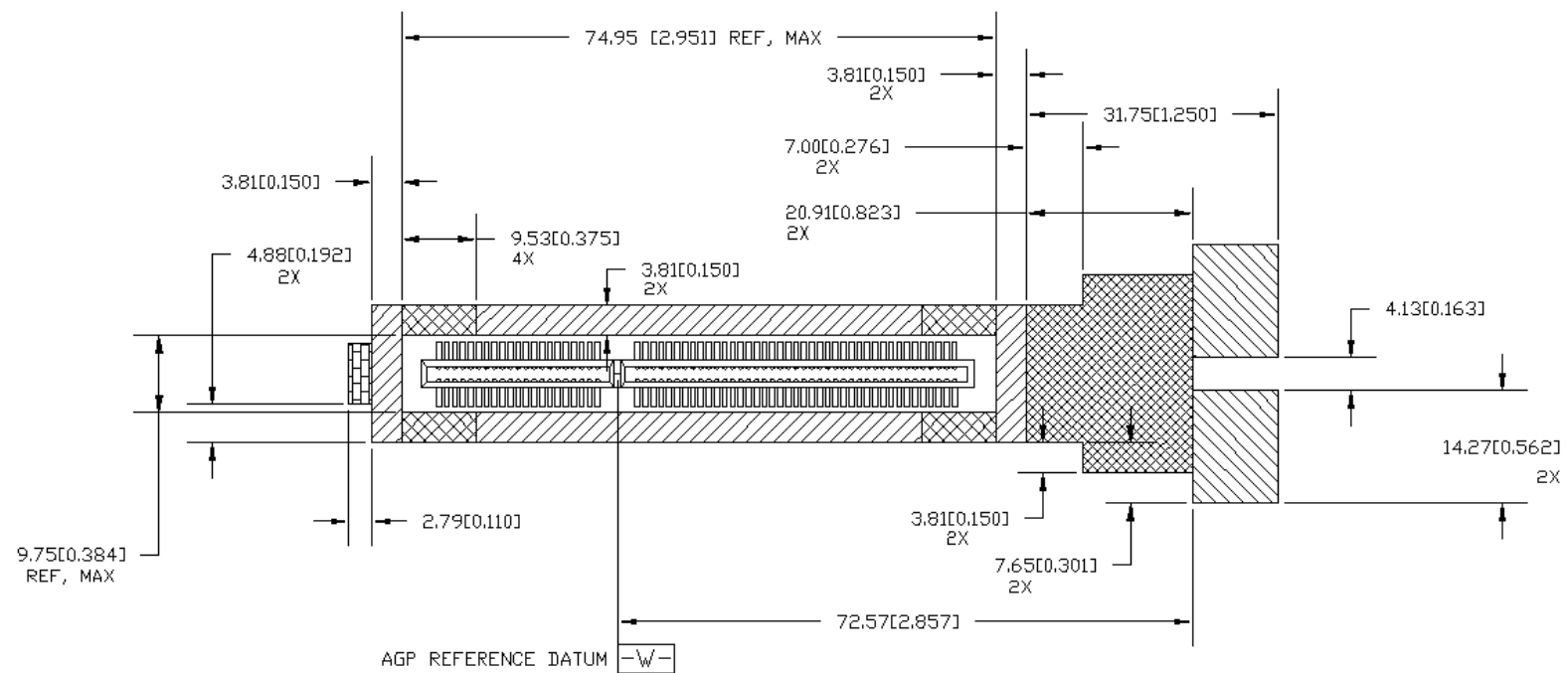


Figure 5-12A: Typical ATX 3.3 Volt Connector Implementation.



NOTES:

1. TOLERANCES +/- .127 [.005]
2. MAX COMPONENT HEIGHT OF 3.30 [.130]
3. COMPONENT FREE ZONE
4. MAX COMPONENT HEIGHT OF 5.08 [.200]
5. MAX COMPONENT HEIGHT OF 25.15 [.990]
6. MAX COMPONENT HEIGHT OF 11.43 [.450]

Figure 5-12B: Detail A of 3.3 Volt Connector, Motherboard Component Height Restrictions.

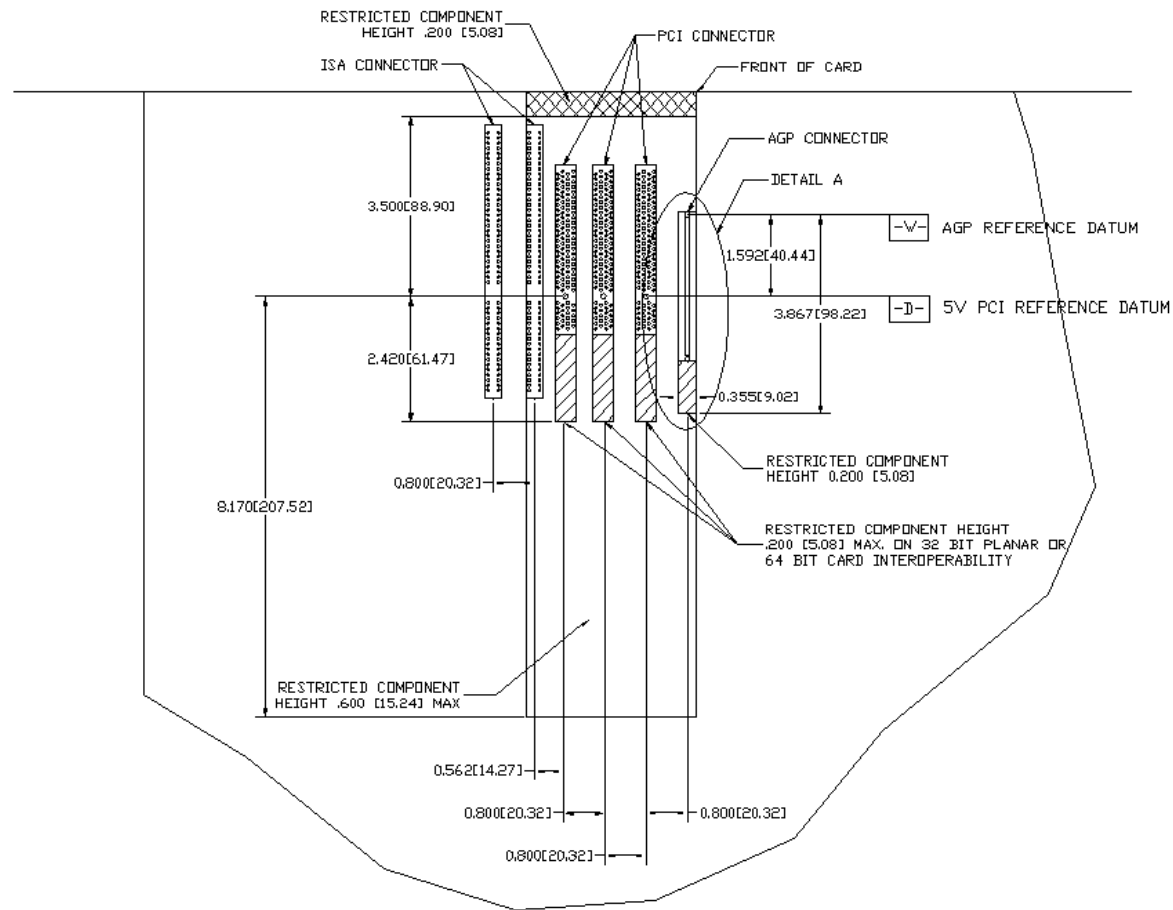
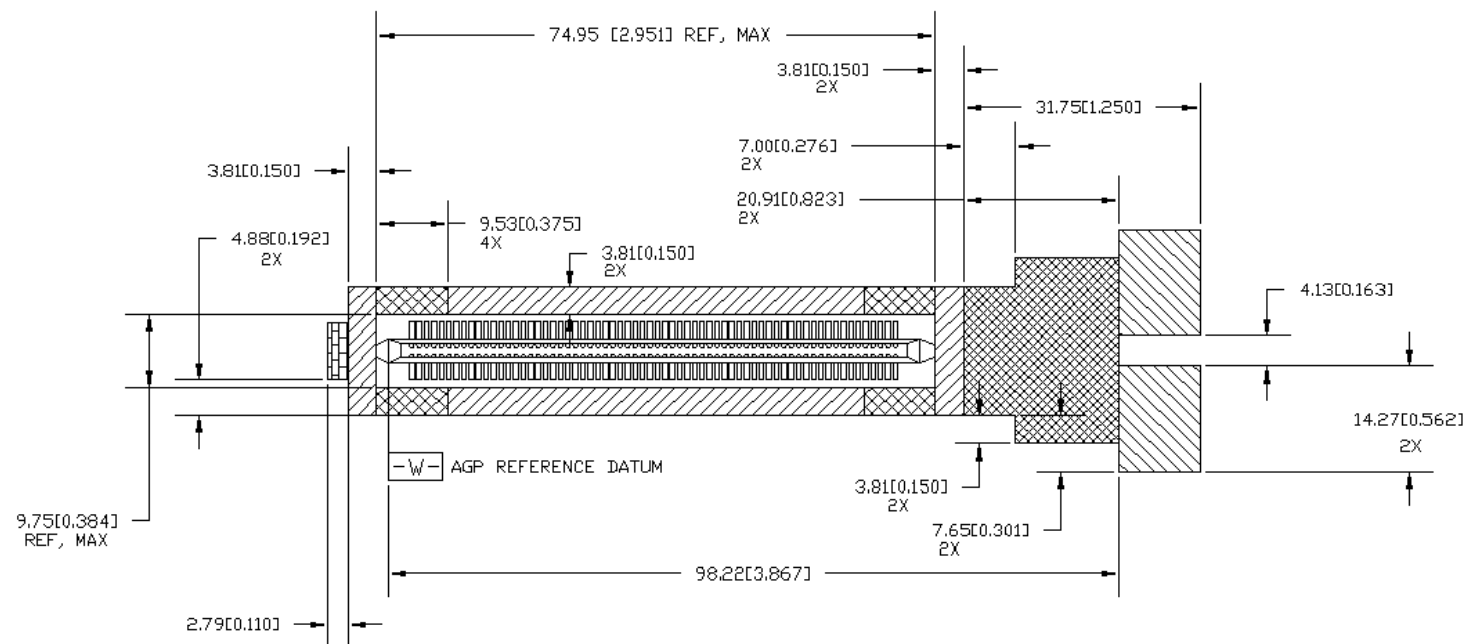


Figure 5-13A: Typical ATX Universal Connector Implementation.



NOTES:






1. TOLERANCES +/- .127 [.005]
2.  MAX COMPONENT HEIGHT OF 3.30 [.130]
3.  COMPONENT FREE ZONE
4.  MAX COMPONENT HEIGHT OF 5.08 [.200]
5.  MAX COMPONENT HEIGHT OF 25.15 [.990]
6.  MAX COMPONENT HEIGHT OF 11.43 [.450]

Figure 5-13B: Detail A of Universal Connector, Component Height Restrictions.

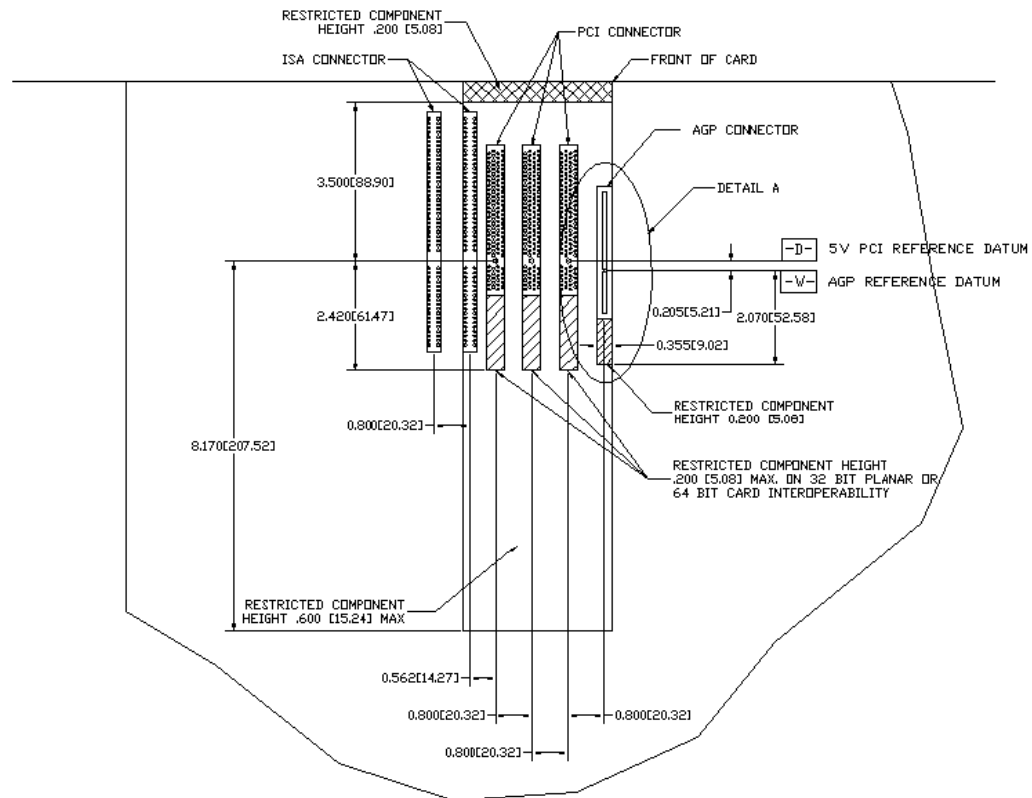
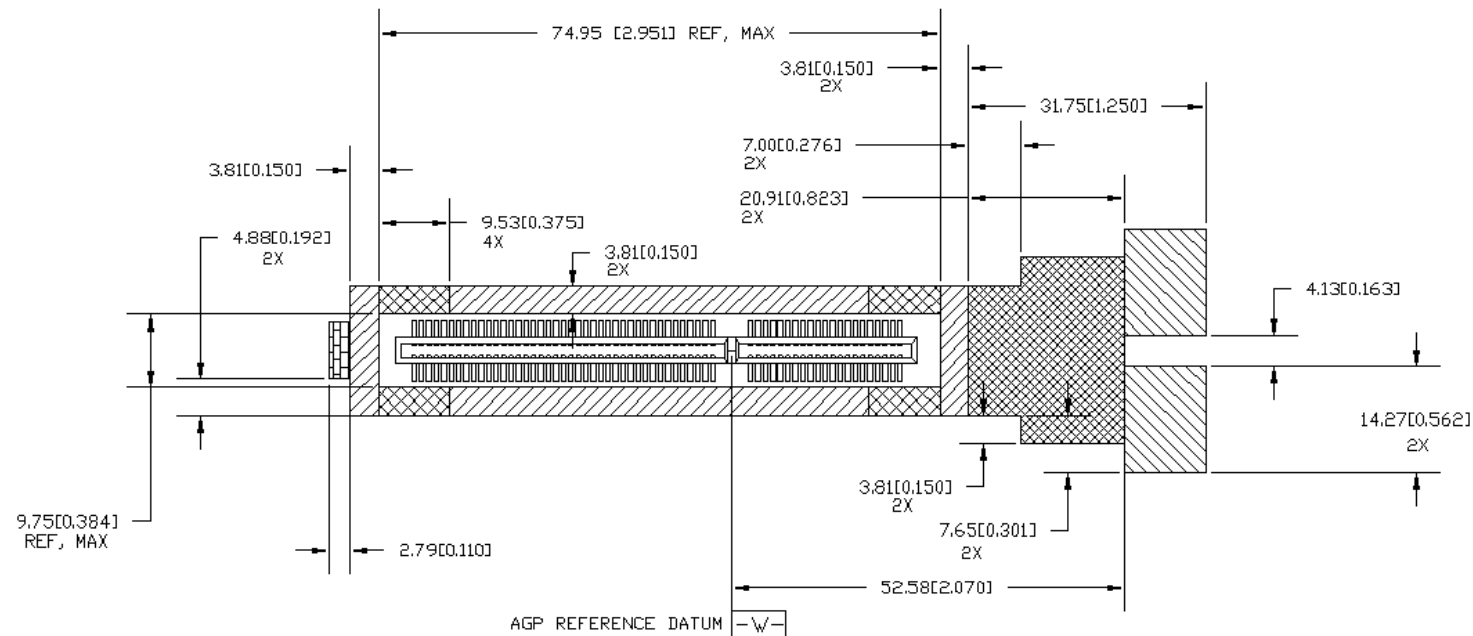


Figure 5-14A: Typical ATX 1.5 Volt Connector Implementation.



NOTES:






1. TOLERANCES +/- .127 [0.005]
2.  MAX COMPONENT HEIGHT OF 3.30 [1.30]
3.  COMPONENT FREE ZONE
4.  MAX COMPONENT HEIGHT OF 5.08 [2.00]
5.  MAX COMPONENT HEIGHT OF 25.15 [9.90]
6.  MAX COMPONENT HEIGHT OF 11.43 [4.50]

Figure 5-14B: Detail A of 1.5 Volt Connector, Component Height Restrictions.